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REMARKS

Further consideration of the subject application in light of the remarks which follow is respectfully requested.

Claims 1, 2, 4-15, 17-26, 27-39, and 41-58 are pending. Claims 47 and 48 have been withdrawn from further consideration. Claims 3, 16, 27, and 40 have been cancelled, and new Claims 49-58 have been added.

Claim Rejections Under 35 USC §112, first paragraph

Claims 1-46 have been rejected under 35 USC §112, first paragraph. The Office contends that Claims 1, 3, 14, 16, 25, 27, 38, and 40, amended in the Preliminary Amendment filed August 15, 2003, lack support in the application as originally filed. In particular, the phrase "carbonation catalyst comprising carbonates and/or bicarbonates of quaternary ammonium bases" is alleged to lack support.

The statement has been amended to further clarify its meaning. Support for the amended phrase can be found in numbered paragraph (0018), (0019) and (0020) wherein Applicants recite:

"[i]n preparing the dialkyl carbonates and diols, an alkylene oxide is first reacted with CO2 in the presence of a halogen-free carbonation catalyst (e.g., [1,1'(1-butylbenzimidazol-2yl)pentane]copper(II) di(trifluoromethanesulfonate), or hydroxides, carbonates or bicarbonates of quaternary ammonium bases) to provide a corresponding cyclic carbonate."

The Office further suggests that the term "catalyst" is always recited in the specification in the singular form, and therefore only a single catalyst is interpreted and not mixtures of catalysts.

Applicants respectfully disagree. Examiner's attention is directed to numbered paragraphs (0019) and (0020), wherein Applicants disclose "[p]referred catalysts are the quaternary ammonium compounds...

Examples of quaternary ammonium compounds suitable as catalysts in accordance with this invention ...and the corresponding carbonates and bicarbonates of the above enumerated compounds."

The specification is replete with the recitation of catalysts (i.e., the plural form of catalyst). Accordingly, the claims which recite catalysts are supported in the specification.

Claims 3, 16, 27, and 40 have been rejected as reciting a halogen-free carbonation catalyst, yet reciting a catalyst comprising fluorine. Claims 3, 16, 27, and 40 have been cancelled, and New Claim 49 has been added, which recites a process utilizing a chlorine-free carbonation catalyst and a crude product stream which exhibits a chloride concentration of about 5 ppm or less.

Support for this amendment may be found in numbered paragraph (0017), wherein Applicants disclose an embodiment in terms of "a halogen (i.e., chlorine) concentration of 5 ppm or less" and thus define halogen to be chlorine in that embodiment. In numbered paragraph (0018), Applicants define [1,1'(1-butylbenzimidazol-2yl)pentane]copper(II) di(trifluoromethanesulfonate) to be a halogen-free carbonation catalyst of the present invention.

Accordingly, the claims, as amended, are supported in the specification as originally filed. Removal of the rejection is respectfully requested.

Claim Rejections Under 35 USC §112, second paragraph

Claims 1-46 have been rejected under 35 USC §112, second paragraph. The Office contends that the phrase "a halogen concentration of about 5 ppm or less" is unclear since the catalyst is halogen-free and none of the reactants recite that a halogen can be present. In Claim 1, applicants recite:

> "wherein said crude product stream exhibits a halogen concentration of about 5 ppm or less."

The recited limitation further clarifies the halogen concentration of the crude product stream of Applicants' presently claimed invention. Thus the halogen concentration of

all the components must in turn be so limited to fall within the bounds of the recited claim. Accordingly, the limitation does not render the rejected claims indefinite, but instead further clarifies that which Applicants regard as their invention.

Claim 2 has been amended to correct the obvious typographical error such that Claim 2 now depends from "Claim 1" and not from "Claim I."

Double Patenting

Claims 1, 2, 4-15, 17-26, 28-39, and 41-46 have been rejected on the grounds of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1-12 of U.S. Patent No. 6,407,279 ("Buchanan".).

Claims 1-12 of Buchanan are directed to an integrated process for the production of dialkyl carbonate which includes the step of reacting an alkylene oxide with carbon dioxide in the presence of a carbonation catalyst. In Col. 2, lines 6-15, Buchanan discloses carbonation catalysts to be "alkali metal halides; ammonium, phosphonium or sulphonium halide carbonates; a combination of protic compounds, such as alcohols, and nitrogen-containing bases, arsonium halides; tertiary phosphines with alcohols; and alkali metal transfer catalysts with crown ethers and other ligands." Buchanan fails to disclose or suggest Applicants' recited halogen-free carbonation catalyst comprising carbonates and/or bicarbonates of quaternary ammonium bases. Since Buchanan fails to disclose or suggest all the limitations of Applicants' presently claimed invention, Buchanan cannot anticipate nor render obvious Applicants' presently claimed invention. As such, Applicants' presently claimed invention is patentably distinct over Buchanan. Removal of the rejection is respectfully requested.

Obviousness Rejection Under 35 U.S.C. §103(a)

Claims 1, 2, 4-15, 17-26, 28-39, and 41-46 have been rejected as obvious over Buchanan alone, or taken in view of U.S. Patent No. 3,535,341 to Emmons et al. ("Emmons") and U.S. Patent No. 2,873,282 to McClellan ("McClellan".)

Applicants recite a process comprising the steps of:

(a) reacting an alkylene oxide with carbon dioxide in the presence of a halogen-free carbonation catalyst comprising carbonates and/or bicarbonates of quaternary ammonium bases at a temperature in the range of about 50°C to 250°C and at a pressure of at least about 1379 kPa (200 psi) to provide a crude cyclic carbonate stream comprising a cyclic carbonate and said catalyst; and

(b) reacting said cyclic carbonate with said aliphatic monohydric alcohol in the presence of said catalyst to provide a crude product stream comprising said dialkyl carbonate and said diol, wherein said crude product stream exhibits a halogen concentration of about 5 ppm or less.

As discussed above, and as Office acknowledges, Buchanan fails to disclose or suggest the catalyst recited in Applicants' presently claimed invention. Buchanan thus fails to disclose Applicants' recited catalyst to produce the cyclic carbonates of step (a). Buchanan also fails to disclose or suggest Applicants' recited catalyst of step (b), wherein the cyclic carbonate of step a) is reacted with the alcohol to produce the dialkyl carbonate and the diol.

The Office suggests both Emmons and McClellan teach the use of quaternary ammonium compounds as catalysts in processes of making alkylene carbonates (Applicants' recited step (a).) The Office further suggests that one skilled in the art would have been motivated to utilize the process taught by Buchanan with the alkylene carbonates of Emmons or McClellan to produce Applicants' presently claimed invention.

However, Emmons and McClellan are directed to catalytic processes for producing alkylene carbonates. Emmons and McClellan both disclose the use of quaternary ammonium compounds as catalysts to produce alkylene carbonates from alkylene oxides and carbon dioxide. Neither reference discloses or suggests Applicants' recited step (b) of reacting a cyclic carbonate with an aliphatic monohydric alcohol in the presence of the halogen-free carbonation catalyst comprising carbonates and/or bicarbonates of quaternary ammonium bases, to

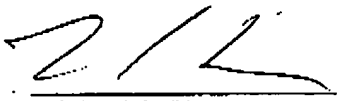
provide a crude product stream comprising dialkyl carbonate and diol, wherein the crude product stream exhibits a halogen concentration of about 5 ppm or less.

As such, while Emmons and McClellan disclose a catalyst similar to that utilized by Applicants in step (a) of the presently claimed invention, both references fail to disclose or suggest the use of that same catalyst in step (b) of Applicants' presently claimed invention. Emmons and McClellan thus fail to cure the deficiencies in Buchanan. As such, neither Buchanan alone, nor Buchanan in view of Emmons and/or McClellan render Applicants' presently claimed invention obvious. Applicants respectfully request removal of the rejection.

Accordingly, Applicants respectfully request reconsideration in view of the above amendments and remarks, that the rejection of the claims be removed, and that the claims, as amended, be passed to allowance.

The Commissioner is hereby authorized to charge any additional fees which may be required by this paper, or credit any overpayment, to Deposit Account Number 05-1712.

Respectfully submitted,



Date: July 19, 2006

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